

Navy scientists look to improve safety in low oxygen environments

Naval Medical Research Unit Dayton

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KISSIMEE, Florida - Researchers from the Naval Medical Research Unit Dayton (NAMRU-Dayton) presented human performance research during a breakout session at the 2018 Military Health System Research Symposium (MHSRS) in Kissimmee, Florida, Aug. 22.

“This research study aims to improve safety in a variety of tasks that might occur in low oxygen environments, such as our aircrew and diving communities,” said Lt. Todd Seech, aerospace experimental psychologist and co-investigator.

By examining the efficacy of an electroencephalography (EEG) signal complex, known as a Mismatch Negativity/P3a, Navy researchers may be able to predict the onset of performance deficits in low oxygen environments earlier and more accurately than pulse oximetry.

Test subjects completed two testing sessions on separate days that differed only in simulated altitude environment. One session occurred at 17,500 feet and the other session occurred at 500 feet. In both, participants performed a continuous hand eye coordination task while EEG and finger pulse oximetry were recorded. The study procedures took place in NAMRU-Dayton’s Reduced Oxygen Breathing Environment (ROBE).

Initial results suggest EEG may serve as an early predictor of performance decline during exposure to low oxygen. The amplitude of the awareness was reduced in the hypoxia compared to the normoxia condition suggested an impairment in attentional reorienting.

“With further development, EEG may represent a sensitive method for detecting hypoxia prior to symptom onset and performance decrement in pilots,” said Dr. Kara Blacker, research psychologist, contractor with Henry M. Jackson Foundation for the Advancement of Military Medicine assigned to NAMRU-Dayton.

MHSRS is the Department of Defense’s (DoD) premier scientific conference bringing together scientists, academia, and industry to exchange information on research and health care advancements. Research areas include combat casualty care, military operational medicine, clinical and rehabilitative medicine, and military infectious disease research programs.

The Naval Medical Research Unit Dayton is a major DoD medical research command and the home of the Naval Aerospace Medical Research Laboratory and the Environmental Health Effects Laboratory. As a subordinate command to Naval Medical Research Center, NAMRU-Dayton conducts aerospace medical and environmental health effects research to enhance warfighter health, safety, performance and readiness. We address identified Fleet needs and results in products and solutions ranging from basic knowledge to fielded technologies.

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